Notice No. 5

Rules and Regulations for the Classification of Ships, July 2015

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Issue date: December 2015

Amendments to	Effective date
Part 1, Chapter 2, Section 2	1 January 2016
Part 3, Chapter 1, Section 9	1 January 2016

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Part 1, Chapter 2

Classification Regulations

Effective date 1 January 2016

■ *Section 2*
Character of classification and class notations

2.4 Class notations (machinery)

(*Part only shown*)
Table 2.2.4: Machinery Class Notations

Machinery Notations *See* 2.4, Pt 1, Ch 2, 2.5 Class notations (machinery special features), Pt 1, Ch 2, 2.6 Class notations (refrigerated cargo installations (RMC), controlled atmosphere (CA) systems and carriage of refrigerated containers (CRC))		
MCH Propulsion and essential machinery **LFPF( )** Machinery installation fuelled by low flashpoint fuel	~~**GF**~~ ~~Natural Gas Fuelled Ships~~	✠ **Lloyd's RMC (LG)** Reliquefaction and/or refrigeration equipment is fitted

2.5 Class notations (machinery special features)

2.5.5 The following class notation is associated with ~~gas~~ low flashpoint fuelled vessels and may be assigned as considered appropriate by the Classification Committee:

~~**GF**~~ ~~Assigned to ships other than LNG carriers where the main propelling and/or auxiliary machinery is designed to operate on natural gas as fuel, or a combination of natural gas and oil fuel. The notation also indicates that the gas-fuelled machinery has been installed and tested in accordance with LR's Rules and Regulations.~~

LFPF( ) Assigned where the main propelling and/or auxiliary machinery is designed to operate using a low flashpoint fuel in accordance with the applicable LR Rules and Regulations. As a minimum, the **LFPF( )** notation is to be appended by associated characters **GC** or **GF** and one two letter fuel identifier, and will be entered in column 4 of the *Register Book*;

GC Assigned to liquefied gas carriers or tankers, where the main propelling and/or auxiliary machinery is designed to operate on a low flashpoint fuel. The notation also indicates that the gas-fuelled machinery has been constructed, arranged, installed and tested in accordance with the relevant requirements of Chapter 16 of LR's Rules for Ships for Liquefied Gases, or is equivalent thereto.

GF Assigned to ships other than liquefied gas carriers or tankers, where the main propelling and/or auxiliary machinery is designed to operate on a low flashpoint fuel, or a combination of low flashpoint fuel and standard marine oil fuel. The notation also indicates that the low flashpoint fuelled machinery has been constructed, arranged, installed and tested in accordance with the LR Rules and Regulations applicable to the fuel(s) used.

The low flashpoint fuel (or fuels) that the ship is designed to use is (are) indicated in the notation using a two letter identifier:

NG Natural Gas
EG Ethane Gas
LP Liquid Petroleum Gas (LPG is considered to include pure propane or Butane or any mixture of the two)
HG Hydrogen Gas
ML Methanol

2.8 Descriptive notes

2.8.7 **GR**. Assigned to ships other than LNG carriers, detailing the aspects of design and construction that are prepared for gas fuel operation in accordance with LR's Rules and Regulations in force on the date of 'contract for construction'. If a ship has been assigned the ~~**GF**~~ **LFPF(GF, NG)** notation then it will not be eligible for the **GR** descriptive note. The descriptive note **GR**, with the extension of one or more of the following associated characters shown in brackets, may be entered in column 6 of the *Register Book*.

Part 3, Chapter 1

General

Effective date 1 January 2016

9.2 Application

9.2.1 The testing requirements for gravity tanks, defined as tanks subject to a vapour pressure not greater than 70 kN/m^2, and other boundaries required to be watertight or weathertight, are to be tested in accordance with this Section. Tests are to be carried out in the presence of a Surveyor at a stage sufficiently close to completion such that the strength and tightness are not subsequently impaired and prior to any sealing and cement work being applied over joints, *see also* Pt 3, Ch 1, 9.7 Application of coating.

9.2.2 Attention is drawn to SOLAS Reg. II-1/11. Exemptions of structural tests detailed in SOLAS Reg. II-1/11 are to be agreed with the relevant Flag Administration.

~~9.2.2~~ 9.2.3 The testing of cargo containment systems of liquefied gas carriers are to be in accordance with the requirements of Ch 4~~, 10 Construction and testing~~ of the *Rules and Regulations for the Classification of Ships for the Carriage of Liquefied Gases in Bulk*.

Existing paragraph 9.2.3 *has been renumbered* 9.2.4*.*

9.4 Structural test procedures

9.4.1 Where a structural test is specified in Table 1.9.1 Testing requirements, unless specified otherwise, a hydrostatic test is to be carried out in accordance with Pt 3, Ch 1, 9.6 Definitions and details of tests. Where practical limitations prevent a hydrostatic test being carried out, a hydropneumatic test in accordance with Pt 3, Ch 1, 9.6 Definitions and details of tests is to be conducted. All external boundaries of the tested space are to be examined for structural distortion, bulging, buckling, or other related damage and/or leaks.

9.4.2 A hydrostatic test or hydropneumatic test may be carried out afloat to confirm the structural adequacy of tanks, provided that a leak test is carried out ~~beforehand~~ and the results are confirmed as satisfactory before the vessel is afloat.

9.4.3 For tanks of the same structural design, configuration and the same general workmanship, as determined by the attending Surveyor, a structural test may be carried out on only one tank, provided all subsequent tanks are tested for leaks by an air test. The relaxation to accept leak testing using an air test instead of a structural test does not apply to cargo space boundaries adjacent to other compartments in tankers and combination carriers ~~and~~ or to the boundaries of tanks for segregated cargoes or pollutants.

9.4.4 Where the structural adequacy of a tank has been verified by structural testing on a previous vessel in a series, tanks of structural similarity on subsequent vessels within that series (which are built at the same shipyard) may be exempt from such testing, provided that the watertightness of all exempt tanks is verified by leak tests and thorough inspection. ~~For sister ships built several years after the last ship in a series, such exemptions may be reconsidered.~~ However, structural testing is to be carried out for at least one tank of each type of tank on ~~each~~ every vessel in the series ~~in order to verify structural fabrication adequacy~~. The relaxation to accept leak testing and thorough inspections instead of a structural test on subsequent vessels in a series does not apply to cargo space boundaries adjacent to other compartments in tankers and combination carriers ~~and~~ or to the boundaries of tanks for segregated cargoes or pollutants.

9.4.5 For sister ships built two or more years after the delivery of the last ship of the series, the relaxation provided for in Pt 3, Ch 1, 9.4 Structural test procedures, 9.4.4 may be accepted provided that the general practices, equipment and workmanship of the shipyard have been maintained continuously, and an enhanced NDT programme is implemented for the tanks not subject to structural tests.

Existing paragraph 9.4.5 *has been renumbered* 9.4.6*.*

9.4.7 Consideration is to be given to the selection of tanks to be structurally tested. Selected tanks ~~should be~~ are to be chosen so that all representative structural members are tested for the expected tension and compression.

~~9.4.6~~ 9.4.8 For watertight boundaries of spaces other than tanks, excluding ~~chain lockers,~~ ballast holds, chain lockers and cargo holds which are intended to be used for in-port ballasting, structural testing may be exempted completely, provided that the watertightness in all boundaries of exempted spaces are verified by leak tests and thorough inspection. The testing of ballast holds, chain lockers and cargo holds which are intended to be used for in-port ballasting, are to comply with the requirements of Pt 3, Ch 1, 9.4, Structural test procedures, 9.4.1 to 9.4.7.

9.5 Leak test procedures

9.5.1 Where a leak test is specified in Table 1.9.1 Testing requirements, unless specified otherwise, a tank air test, compressed air fillet weld test, or vacuum box test is to be carried out in accordance with the applicable requirements of Pt 3, Ch 1, 9.6 Definitions and details of tests to Pt 3, Ch 1, 9.6 Definitions and details of tests. A hydrostatic or hydropneumatic test conducted in accordance with the applicable requirements of Pt 3, Ch 1, 9.6 Definitions and details of tests and Pt 3, Ch 1, 9.6 Definitions and details of tests will be accepted as a leak test on the condition that safe access to all joints being examined is provided, *see* Pt 3, Ch 1, 9.8 Safe access to joints, 9.8.1. Where a hydrostatic or hydropneumatic test is applied as a leak test, the external boundaries are to be free of any liquid residue prior to the commencement of the test.

9.5.4 Where acceptable to the attending Surveyor, provided that careful visual inspections show a continuous uniform weld profile shape, free from repairs, and the results of selected NDE testing show no significant defects, the leak testing of automatic butt welds and semi-automatic (flux core arc welding) butt welds may be omitted.

9.6 Definitions and details of tests

9.6.3 **Hose test** is a test used to verify the tightness of joints with a jet of water. The jet of water is to be directed perpendicular to the joint. It is to be carried out with the pressure in the hose nozzle maintained at not less than 2,0 bar during the test. The hose nozzle is to have a minimum inside diameter of 12 mm and is to be situated no further than 1,5 m from the joint. Where a hose test is not practical because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by a careful visual examination of welded connections, supported by an ultrasonic or penetration leak test, or an equivalent, *see* SOLAS Reg. II-1/11.1.

9.6.4 **Tank air test** is to be used to verify the tightness of a compartment by means of an air pressure differential and leak ~~detection~~ indicator solution. An efficient indicating solution (e.g. soapy water) is to be applied to the weld or penetration being tested and is to be examined whilst an air pressure differential of not less than 0,15 bar is applied by pumping air into the compartment. ~~It is recommended that the air pressure in the tank be raised to and maintained at 0,20 bar above atmospheric pressure for one hour, with a minimum number of personnel in the vicinity of the tank, before being lowered to 0,15 bar above atmospheric pressure.~~ Arrangements are to be made to ensure that any increase in air pressure does not exceed 0,30 bar. A U-tube with a height sufficient to hold a head of water corresponding to the required test pressure is to be used for verification and to avoid overpressure. The cross-sectional area of the U-tube is not to be less than that of the pipe supplying air to the tank. ~~In addition, the test pressure is to be verified by means of a pressure gauge, or alternative equivalent system.~~ Alternatively two calibrated pressure gauges may be considered acceptable. All boundary welds, ~~erection joints and penetrations~~ including pipe connections in the compartment are to be examined twice. The first is to be examined immediately upon applying the leak indication solution; the second approximately five minutes afterwards.

9.6.5 **Compressed air fillet weld test**. This test consists of compressed air being injected into one end of a fillet welded joint and the pressure verified at the other end of the joint by a pressure gauge ~~on the opposite side~~. Pressure gauges are to be arranged so that an air pressure of at least 0,15 bar above atmospheric pressure can be verified at each end of all passages within the portion being tested. A leak indicator solution is to be applied and the weld line examined for leaks. A compressed air test may be carried out for partial penetration welds where the root face is greater than 6 mm.

9.6.6 **Vacuum box test** is a test used to verify the tightness of joints by means of a localised air pressure differential and leak indicator solution. The test is to be conducted with the use of a box with air connections, gauges and an inspection window that is to be placed over the joint being tested with a leak indicator solution applied. The air within the box is to be removed by an ejector to create a vacuum i.e. a pressure differential of 0,20 to 0,26 bar inside the box.

9.6.8 **Penetration test** may be used where a hose test is not practical to assess butt welds, *see* 9.6.3, by applying a low surface tension liquid to one side of a compartment boundary. When no liquid is detected on the opposite side of the boundary after expiration of a ~~definite~~ defined period of time, the verification of tightness of the compartment's boundary may be assumed. A developer solution may be applied on the other side of the weld to aid leak detection.

(*Part only shown*)

Table 1.9.1: Testing requirements

Item to be tested	Testing procedure	Test requirement
Ballast hold of bulk carriers	Leak and structural	~~The greater of:~~ ~~• head of water up to the top of the overflow~~ • ~~head~~ Head of water up to the top of cargo hatch coaming, *see* Note 10
Holds used for in-port ballasting	Leak and structural	A head of water representing the maximum loading that will occur in-port as indicated in the Loading Manual.
Fore peak spaces with equipment	Leak	
Fore peak voids	Leak and structural	Head of water up to the bulkhead deck, *see* Note 8
Aft peak spaces with equipment	Leak	
Independent ~~tanks, and~~ edible liquid tanks	Leak and structural	The greater of: • head of water up to the top of the overflow • head of water 0,9 m above top of tank, *see* Note 2
L.O. Sump tanks and other similar tanks/spaces under main engines	Leak	*See* Note 5
Chemical tanker cargo tanks	Leak and structural	The greater of: • head of water 2,4 m above top of tank, *see* Notes 2 and 9 • head of water up to top of tank, *see* Notes 2 and 9, plus setting of fitted pressure-relief valve

Note 2. Top of tank is the deck forming the top of the tank, excluding any hatchways. In holds for liquid cargo or ballast with large hatch openings, the top of tank is to be taken to the top of the hatch.

Note 3. Including ~~duct keels and~~ dry compartments and duct keels arranged in accordance with the provisions of SOLAS Reg. II-1/9.4 and Reg. II-1/11.2, as well as voids used for the protection of fuel oil tanks and pump rooms arranged in accordance with the provisions of MARPOL Annex I, Reg. 12A and Reg. 22.

Note 8. Where demonstrated to be impracticable, the structural testing of fore peak void spaces may be exempted subject to the agreement of the attending Surveyor.

Note 9. Where a cargo tank is designed for the carriage of cargoes with a specific gravity greater than 1,0, an appropriate additional head is to be considered.

Note 10. Where air vents are fitted below the top of the coaming, adequate blanking off of these vents may be required prior to the commencement of the test.

Note ~~8.~~11. Other testing methods listed in 9.6.7 and 9.6.8 may be considered, subject to adequacy of such testing methods being verified, *see* SOLAS Reg. II-1/11.1.

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